



U.S. Fish & Wildlife Service
Sacramento Fish & Wildlife Office
Species Account
SALT MARSH HARVEST MOUSE
Reithrodontomys raviventris



CLASSIFICATION: Endangered
Federal Register 35:16047; October 13, 1970
http://ecos.fws.gov/docs/federal_register/fr27.pdf

STATE LISTING STATUS: Listed as an endangered species in 1971.

CRITICAL HABITAT: None designated

RECOVERY PLAN: FINAL
Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California
edocket.access.gpo.gov/2010/2010-2279.htm
edocket.access.gpo.gov/2010/pdf/2010-2279.pdf (52 KB)



Salt Marsh Harvest Mouse
Valary Bloom, USFWS

5-YEAR REVIEW: Completed February 2010. No change recommended.
http://www.fws.gov/ecos/ajax/docs/five_year_review/doc3221.pdf
(853 KB)

DESCRIPTION

The salt marsh harvest mouse (*Reithrodontomys raviventris*), also known as the "red-bellied harvest mouse," is a small native rodent in the Cricetidae family, which includes field mice, lemmings, muskrats, hamsters and gerbils. There are two subspecies: the northern (*R. r. halicoetes*) and southern (*R. r. raviventris*). The northern subspecies lives in the marshes of the San Pablo and Suisun bays, the southern in the marshes of Corte Madera, Richmond and South San Francisco Bay. (See field identification below)

The scientific name *Reithrodontomys raviventris* means "grooved-toothed mouse with a red belly." Both subspecies do have grooved upper front teeth but generally only the southern subspecies has a cinnamon- or rufous-colored belly.

Salt marsh harvest mice are critically dependent on dense cover and their preferred habitat is pickleweed (*Salicornia virginica*). Harvest mice are seldom found in cordgrass or alkali bulrush. In marshes with an upper zone of peripheral halophytes (salt-tolerant plants), mice use this vegetation to escape the higher tides, and may even spend a considerable portion of their lives there. Mice also move into the adjoining grasslands during the highest winter tides.

The mice probably live on leaves, seeds and stems of plants. In winter, they seem to prefer fresh green grasses. The rest of the year, they tend toward pickleweed and saltgrass. They have longer intestines than the western harvest mouse, which is a seed eater. The northern subspecies of the salt marsh mouse can drink sea water for long periods but prefers fresh water. The southern subspecies can't subsist on sea water but it actually prefers moderately salty water over fresh.

Although salt marsh harvest mice are active mainly at night, they are sometimes active during daylight hours. They swim very well, in contrast to the western harvest mouse, which is a poor swimmer.

Breeding goes on from spring through autumn. However, each female usually has only one or two litters per year. The average litter size is about four. Nests are quite minimal, often built over old birds' nests. Members of the southern group often don't make a nest at all.

Field identification: Both subspecies, particularly the northern one, look very similar to the widely-distributed western harvest mouse (*R. megalotis*). (Genetic analysis does not support a close ancestral relationship between the two. Instead, *genetic* data suggest that the salt marsh harvest mouse is most closely related to the plains harvest mouse, *R. montanus*, a western interior species that does not occur near the central California coast today.)

Field identification is difficult. The underside of the western harvest mouse, including its tail, ranges from white to dark gray. As mentioned above, the belly of the southern salt marsh harvest mouse subspecies tends to be cinnamon- or rufous-colored. The other parts of both species are buff or brown. The backs and ears of the salt marsh mice tend to be darker. Both species have a combined head and body length of around 3 inches and an average weight of less than half an ounce.

Key Field characters distinguishing between the salt marsh harvest mouse and western harvest mouse. (from recovery plan – See above)

Trait	Salt marsh harvest mouse (<i>R. r. raviventris</i>)	Northern salt marsh harvest mouse (<i>R. r. halicoetes</i>)	Western harvest mouse (<i>R. r. megalotis</i>)
tail thickness (20 millimeters from body)	2.1 to 3.0 millimeters (0.083 to 0.118 inch)	2.1 to 3.0 millimeters (0.083 to 0.118 inch)	1.9 to 2.0 millimeters (0.075 to 0.079 inch)
venter (belly) hair color	rusty-cinnamon	white	white
tail hair color	unicolor or indistinctly bicolor (typical)	unicolor or indistinctly bicolor (typical)	distinctly bicolor (typically white hairs below)
average tail:body ratio	94.7 to 105.3	107.0 to 116.8	103.1 to 110.8
tail tip	heavy, relatively blunt	heavy, relatively blunt	relatively pointed
pelage (coat)	relatively thick; long hairs	relatively thick; long hairs	relatively thin; short hairs
activity (during trap, release observation)	relatively placid; infrequent aggressive behavior	relatively placid; infrequent aggressive behavior	relatively active, typical, frequent aggressive behavior
early morning activity	becomes torpid when cold	no torpidity	no torpidity

DISTRIBUTION

The two subspecies are restricted to the salt and brackish marshes of San Francisco, San Pablo, and Suisun Bay areas. The southern subspecies inhabits central and south San Francisco Bay, and has suffered severe habitat loss and fragmentation. Less than 10 percent of its historic habitat acreage

remains, and nearly all is deficient in its structural suitability. The northern subspecies, living in the marshes of San Pablo and Suisun bays, has also sustained extensive habitat loss and degradation, but less so than the southern subspecies.

THREATS

The most fundamental reason for the decline of the salt marsh harvest mouse is loss of habitat through filling (*i.e.*, destruction), subsidence, and vegetation change. Habitat losses include areas associated primarily with historical diking and reclamation of *tidal* salt marshes, urban development of diked salt marshes, and adverse water management in diked brackish marshes of Suisun Marsh.

Much of the East Bay shoreline from San Leandro to Calaveras Point is rapidly eroding. In addition, an estimated 600 acres of former salt marsh along Coyote Creek, Alviso Slough, and Guadalupe Slough, has been converted to fresh- and brackish-water vegetation due to freshwater discharge from South Bay wastewater facilities, and likely no longer supports salt marsh harvest mice.

The suitability of many marshes for salt marsh harvest mice is further limited, and in some cases precluded, by their small size, fragmentation, and lack of other habitat features. In addition, the difference between high and low tides is much greater in the south Bay than in San Pablo or Suisun bays. Many marshes are completely submerged during high tides and lack sufficient escape habitat, likely resulting in nesting failures and high rates of predation. Larger tracts of habitat are needed to maintain stable populations.

Predation. Very little is known about predation impacts to the species, although predation related to flooding has been viewed as an important factor. During high winter tides, it is common to see great blue herons, great egrets, snowy egrets, ring-billed gulls, California gulls, and American kestrels all taking small mammals from the upper edges and flooded areas of marshes. Protection from predators depends on the dense vegetation cover of typical salt marsh harvest mouse habitat. Mice that leave this cover, or those forced out by flooding, are exposed to predation by hawks and gulls by day, and short-eared owls (*Asio flammeus*) at night. Clapper rails (*Rallus longirostris obsoletus*) and herons also occasionally take small mammals. The impact of terrestrial predators on salt marsh harvest mice has not been studied. Potential terrestrial predators include red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), feral cats (*Felix domestica*), skunks (*Mephitis mephitis*), and raccoons (*Procyon lotor*). The overall impact of non-flood predation on the recovery of salt marsh harvest mice is less significant than other factors such as habitat quality and size.

Tidal Marsh Threats

Tidal marsh species occur in a variety of *tidal marsh* habitats where they are limited by the requirements of moisture, *salinity*, topography, soil types, and climatic conditions. Adjacent *uplands* and *ecotone* areas are also crucial habitats for many of these species.

Primary threats to all the listed species include:

- Historical and current habitat loss and fragmentation due to urban development, agriculture, and diking related to duck hunting; altered hydrology and salinity;
- Non-native invasive species
- Inadequate regulatory mechanisms;
- Disturbance
- Contamination
- Sea level rise due to climate change
- Risk of extinction due to vulnerability of small populations in the face of random naturally occurring events.

Of the 193,800 acres of tidal marsh that bordered San Francisco Bay in 1850, about 30,100 remain. This represents an 84 percent reduction. Furthermore, a number of factors influencing remaining tidal marshes limit their habitat values for salt marsh harvest mice.

REFERENCES FOR ADDITIONAL INFORMATION

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Last updated June 1, 2010